

Managing Used Computers

A Guide for Environmentally Sound Disposal

Computers Everywhere

The computer, not very long ago an exotic addition to the workplace, has become an indispensable part of daily life. Computers are getting faster, smarter and cheaper. Some studies conclude that a new generation of computers is born every 18 to 24 months.

The rapid turnover in computer technology is having a troubling side effect: each year millions of computers come to the end of their useful life. A recent study estimates that about 40 million computer systems become obsolete in the U.S. annually. By 2010, about one billion personal computers (PCs) will likely have become obsolete!

It's estimated that three-quarters of all computers ever purchased in the U.S. are currently stored in warehouses, attics and office closets. Some are being recycled. Of those computers that become obsolete, only 5-15% is recycled. The rest are ending up in landfills or incinerators.

Why are used computers a potential problem for businesses & institutions?

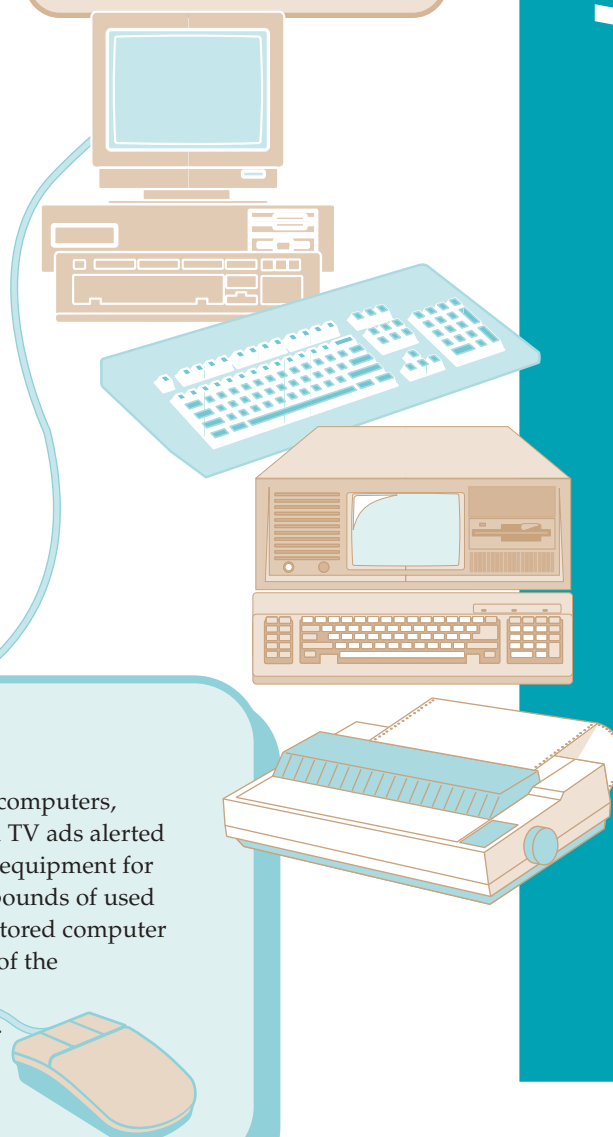
Businesses and institutions need to be concerned about what happens to their used computers because they contain toxic metals which may make them subject to full hazardous waste regulation if landfilled or incinerated. However, the good news is that these same computers are subject to reduced hazardous waste regulation if they are reused or recycled.

Madison Rounds Up Old Computers

The City of Madison held its 12th one-day collection for computers, televisions and cellular phones on April 23, 2005. Radio and TV ads alerted area residents that they could drop off their used computer equipment for free. In six hours citizens brought in approximately 90,000 pounds of used equipment. That amount likely represents about 2% of the stored computer equipment in the Madison metropolitan area. The majority of the equipment was taken to Cascade Asset Management where it was disassembled and sold as scrap or properly disposed. Equipment in working condition was refurbished and donated to local non-profit organizations.

Examples of Used Computer Components:

- Central Processing Units (CPUs)
- Monitors
- Printers
- Keyboards
- Laptops
- Peripherals (modems, mice, storage drives, etc.)
- Terminals
- Mainframes



Used Computers from Households

Household used computers generally are not subject to hazardous waste regulation. However, this exemption does not apply if the computer was used in a home business where it would be subject to full hazardous waste regulation if it is not reused or recycled. Check with your municipal government to see if there are local restrictions on waste computer management. (A number of states and some municipalities have banned or are considering a ban on landfilling or incinerating cathode ray tubes [CRTs] from any source, including households.) Homeowners are *strongly* encouraged to recycle their used computers by taking advantage of the options described for businesses.

Why can used computers be regulated as hazardous waste?

Computers are known to contain beryllium, cadmium, chromium, gold, lithium, lead, mercury, nickel, silver and zinc. If computer components are burned or landfilled, the heavy metals in them can be released to the environment and threaten human health and the environment. Wisconsin's hazardous waste regulations prohibit businesses and institutions from disposing waste computers in solid waste landfills and incinerators if they exceed toxicity characteristic levels.

Hazardous waste toxicity characteristics are defined by a common laboratory test known as the toxicity characteristics

What are the toxic and hazardous materials in your computer?

Lead, cadmium, mercury and other metals from cathode ray tubes (CRTs) found in monitors and terminals

Chromium, lead, beryllium, mercury, cadmium, nickel, zinc, silver and gold from printed circuit boards found in all components

Nickel, cadmium, lithium, mercury and lead from batteries found in central processing units (CPUs), laptops & portable printers

Mercury found in CPUs, monitors and terminals, laptop liquid crystal displays (LCDs) may exceed the toxicity characteristics level for mercury.

leaching procedure (TCLP), and by regulatory levels for 39 chemicals, including 8 metals. Computer monitors, central processing units (CPUs), keyboards and printers all have printed circuit boards that contain metals and likely exceed toxicity characteristic levels. In addition, lead in the monitor's CRT generally causes it to exceed the toxicity characteristic level for lead. (Lead usually makes up about 4-8 lbs. of the total weight of the monitor.)

Businesses and institutions that do not recycle their used computers are subject to applicable solid and hazardous waste rules, including the hazardous waste generator requirements in chs. NR 600 – 679, Wis. Adm. Code. They may also be required to obtain licenses for storage and transportation of their waste computers from the Department of Natural Resources (DNR).

How are regulations reduced for businesses and institutions that recycle their used computers?

Although used computer components contain toxic and hazardous substances, they can be given another life when reused or recycled. A computer component that is fully functional and is used for its original intended purpose is not a waste and therefore is not regulated by DNR. Wisconsin has reduced the hazardous waste regulation of used CRTs when they are legitimately recycled.

- Businesses and institutions may store their used computer monitors and terminals. Intact CRTs may be stored at a facility as long as they are not speculatively accumulated (see next page for definition) and are properly managed.
- Broken CRTs shall be handled according to the guidelines for used computer transporters and recyclers.
- Businesses and institutions may safely collect and transport their own used computers from several locations to a central facility, or to a Wisconsin recycler, without a solid or hazardous waste transporter's license or a hazardous waste manifest. However, if the computers are transported out-of-state, those states may require a transporter's license, manifest and compliance with any other applicable solid and hazardous waste requirements.
- The DNR, by using its enforcement discretion, is allowing this type of reduced regulation to apply to intact and broken monitors and terminals to encourage their recycling.

Guidelines for used computer transporters and recyclers

It is not necessary to have a solid or hazardous waste transportation license from the DNR in order to transport used computers to a recycler. Transporters of used computers should check with the Wisconsin Department of Transportation about the applicability of hazardous materials transportation regulations.

Regulations affecting computer recyclers are reduced to encourage recycling. To be exempt from full hazardous waste regulation, recyclers should manage their CRTs, monitors and terminals following the guidelines below. Wisconsin recyclers that fail to follow these are subject to the hazardous waste recycling requirements in ch. NR 661.

Storage: Broken or processed CRTs must either be stored in a building with a roof, floor and walls, or placed in a container (i.e. a package or a vehicle) that is constructed, filled and closed to minimize identifiable releases of CRT glass to the environment (including fine solid materials). CRTs undergoing processing are subject to the same requirements for storage, labeling and speculative accumulation as stated above for CRTs destined for recycling. Speculative accumulation of CRTs is not allowed.

Labeling: Each container in which broken or processed CRTs are contained must be labeled or marked clearly with one of the following phrases: "waste cathode ray tubes – contains leaded glass" or "used cathode ray tubes – contains leaded glass". Containers must also be labeled: "do not mix with other glass materials".

Processing: All CRTs must be processed within a building with a roof, floor and walls, and no activities using temperatures high enough to volatilize lead from CRTs may be performed.

Record keeping: Facilities accumulating or processing CRTs must keep records for at least three years to verify that CRTs are being recycled and that speculative accumulation has not occurred.

Transportation: All broken or processed CRTs must be transported in a container that meets the requirements described in the storage and labeling standards above.

Speculative Accumulation: All CRTs are subject to speculative accumulation prohibitions as defined in ch. NR 661.01(3)(h), Wis. Adm. Code. This means that accumulating material is not allowed unless the person accumulating the material can show that the material is potentially recyclable and has a feasible means of recycling it. Also, the amount of material recycled or transferred to a different site for recycling must equal at least 75% by weight or volume of that material accumulated from the beginning of the period. CRT glass sent to CRT glass-to-glass recycling or lead smelting is not a hazardous waste unless it is speculatively accumulated. Facilities managing CRTs shall keep records for three years to verify CRTs were recycled and speculative accumulation did not occur.

Computer components other than monitors are exempt from full hazardous waste regulation if the circuit boards they contain are recycled as scrap metal and if the generator complies with NR 661.02 Table 1 and s. NR 661.06(1)(c)2.

Recycling facilities that receive computers from businesses or institutions cannot legally dispose components or parts that are hazardous waste in Wisconsin solid waste landfills or incinerators.

The Hazardous Waste Exemption for scrap metal that is recycled (ss. NR 661.06(1)(c)2, 661.01(3)(h), and 661.02 Table 1, Wis. Adm. Code) requires:

- the generator provide, at the DNR's request, information about the scrap metal being recycled, the recycling facility and the market for the scrap metal;
- that scrap metal not be used in a manner constituting disposal, or used to produce products that are applied to the land; and
- 75% of the scrap metal be recycled, or transferred to a different site for recycling, each calendar year.

What are the management options for used computers?

Options are available that give old computers a new lease on life, spare the expense and hassle of managing them as fully-regulated hazardous waste and safeguard the environment. The following list provides some ideas to get you started.

Computer Recyclers: There are a number of computer recycling centers and electronics demanufacturers in Wisconsin and the Midwest. These businesses disassemble computers, salvage parts and sell reclaimed materials. Before choosing a computer recycler, check to make sure the firm meets applicable regulatory requirements; has the appropriate environmental, safety and health programs; and, has disposal and recycling outlets for the recovered materials. To protect your company, make sure the facility handling your obsolete computers is managing them in an environmentally safe way. A listing of recyclers can be found in DNR's Wisconsin Recycling Markets Directory (<http://dnr.wi.gov/org/aw/wm/recycle/index.html>). Being listed in the Markets Directory does not imply endorsement by the DNR. You may contact your local DNR regional waste management specialist to find out if any enforcement actions may have occurred or are pending against a specific Wisconsin recycler. An e-recycler checklist (Pub WA-615) is also available on the DNR Waste and Materials Management publications web site (<http://dnr.wi.gov/org/aw/wm/publications>). You may use this checklist to verify if a recycler will meet your environmental concerns and needs.

Computer Donation: Donating usable computers to a school or nonprofit group benefits both the receiving organization and the company making the donation. The depreciated value of the donated equipment may be tax deductible. Check with your tax consultant or the IRS. A new provision in the tax code allows for a full deduction of the

purchase price of equipment up to two years old, plus deductions of installation and transfer costs, if the equipment is donated to K-12 schools or foundations supporting those schools. The web site; <http://www.pcsforschools.org> may provide some useful information. Check first with the potential recipients to make sure they can use your equipment. A list of international refurbishing programs (East-West Foundation, Detwiler Foundation, etc.) and local club programs can be found on the Internet.

Resale: Some companies sell or offer their used computers to employees. Others sell or give them to computer repair/resale businesses. Check the Yellow Pages listings for "Computers: Sales and Service" to find these companies.

Leasing Companies: Original equipment manufacturers (OEMs), such as IBM, Digital, Dell, Compaq and Gateway, offer leasing options. Many third party leasing operations that purchase and then lease OEM equipment can be found on the Internet. Contact companies directly for more information. Additionally, several computer manufacturing companies have started take-back or recycling programs. Information on these programs can be found at the manufacturer's web site on the Internet.

Asset Management: Asset management companies provide a full-service surplus electronics collection, component recovery and refurbishing program for corporations. A list of these companies can be found on the Internet.

Materials Exchange: List the items on a materials exchange that finds users for surplus materials. In Wisconsin, contact the Business Materials Exchange (BMEX) at (800) 364-3233 or go to their web site: <http://www.bmex.org>.

Resources

Regulatory Questions: Contact DNR regional waste management staff with question about computer recycling or disposal.

Fitchburg – (608) 275-3266
Milwaukee – (414) 263-8500
Green Bay – (920) 662-5100
Spooner – (715) 635-2101
Rhineland – (715) 365-8900
Eau Claire – (715) 839-3700



List of Computer Recyclers: A current list of businesses and nonprofits that accept computers for reuse or recycling is available on the Internet at:
<http://www.dnr.wi.gov/org/aw/wm/markets/>

The DNR Waste Reduction and Recycling Demonstration Grant Program provides grants for innovative projects covering up to 50% of total costs. For more information call (608) 267-9207.

What to Ask When Selecting a Computer Recycler

- Does the firm have the necessary state and local permits?
- How does the facility manage the materials and wastes?
- Does the firm have contracts with foundries and scrap dealers for its metals? With precious metal refiners for its circuit boards? Has the company completed an environmental audit of these facilities?
- Is there a program in place for dealing with CRTs?
- Can the firm provide traceability of the materials it processes? Can this be audited by customers?
- Does the firm have sufficient liability insurance coverage?
- Does the firm have a Hazard Communication Plan, Worker Safety Training Program and Right to Know Training Program?
- Is proper protective equipment available and used by employees?

Taken from "Recycling Used Computers and Electronics", Solid and Hazardous Waste Education Center, Waste Education Series, 725.JK.9801. If you have any questions, call your regional hazardous waste specialist.

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